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ALTERNATIVE ENERGY

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There's no shortage of energy in the world. Energy comes in many forms – heat, light, sound, electrical and mechanical. The problem is how to convert this energy into the type of energy we need most today – electricity. A device that convert one form of energy to another is called generator. The traditional generator convert heat energy from coal or gas into electrical energy. The generators of the future will harness renewable forms of energy in a similar way. Wind power has been used for hundreds of years in the form of the old-fashioned windmill, which converted one form of mechanical energy (wind) into another(the milling process). The modern version of the windmill is the aerogenerator, which converts wind energy into electrical energy. The aerogenerator is relatively cheap and quick to build. Wind power is clean and plentiful, and an aerogenerator does no damage to the environment, but the aerogenerator are noisy and the electricity cannot be stored easily on calm days. Wind power cannot, of course, be used in places where there is not much wind! Aerogeneratorare best sited in coastal or mountain areas. Water can provide power in three ways: wave, tidal and hydroelectric. The wave energy is plentiful. The biggest technical problem is transmitting the electrical energy from the sea to the land. Wave power stations can potentially upset the local ecosystem. They must be carefully planned and sited where they will do little damage to marine and shore life. Tidal energy is harnessed by building a barrage across a river with a large tidal range – that is, a large difference between high tide and low tide. Power is generated either intermittently (when water flowing back out to sea on the ebb tide is used to drive turbines), or continuously (when the energy of the rising tide is also used).

Hydroelectric energy used the mechanical energy from flowing rivers to generate electricity. It needs fast flowing water, so hydroelectric power stations are usually sited in mountainous regions and where the current of the river is fast. The current is much lower in the dry season, so most hydroelectric projects include reservoirs and dams to store water. Electricity can then be generated all year round. Some hydroelectric stations pump water back to a high reservoir during the night (when demand for electricity is low). Like wave and tidal power, hydroelectric power has a high capital cost but low running costs. Hydroelectric power is a clean and renewable source of energy, and can be environmentally friendly. Dams and reservoirs can destroy the ecological balance of the rivers and surrounding wetlands. Local people, who are a part of this ecosystem, can lose their homes and their livelihood.

Solar power is energy generated from sun. Many electronic devices, such as watches and calculators, can use the sun's energy directly to provide the power they need. Light energy from the sun changes the electrical conducting properties of the silicon crystals, and a tiny electric current starts to flow. This system is called a solar cell. Although solar sell used on earth do not provide much power, satellites in space run on the same principle. They get many times more energy because they are closer to the sun. In the future, workers in space may build huge power station from solar cells many kilometers wide. The electricity generated could be beamed down to earth as microwaves and then converted back into electricity. Most the solar power that we use today is based on much simple principle than the silicon solar cell. Solar panels on the roofs of houses heat water directly for bathing and central heating systems. The industrial version of the solar panel is the solar furnace, in which huge curved solar panel, together with a system of mirrors, concentrate a large amount of solar energy into small area. The heat energy makes steam for generating electricity. Solar power is clean renewable, nonpolluting and does not damage the environment. It's potentially one of the most important sources of energy in the world. A major disadvantage is that the raw materials for solar panels, such as glass and aluminium, are quite expensive.

Geothermal energy is energy from the hot center of the earth. The earth has core of molten rock beneath its solid outercrust. This crust is usually between one and 50 kilometers

thick, but is some places (such as Iceland and New Zealand) it is very thin; the hot molten rock is only a few metres beneath the surface. If we developed the technology to bore deeper beneath the earth's surface, many other countries could use geothermal energy. Because there is so much molten rock within the earth the potential supply of geothermal energy is almost limitless.

The natural world contains many sources of energy. It is possible to convert the energy of the wind, the sea, the rivers, the sun and the hot center of the earth into useful electrical energy. But because alternative energy is a young science, the generator that do this are relatively primitive and in efficient. We need more research into alternative energy. Environmentally – conscious governments must give more funds to research scientists so that they can develop more efficient ways of harnessing natural energy sources.